Culminating Activity

Grade 8 Understanding Life Systems (Cells)

Overview of Grade 8 Understanding Life Systems Cell Unit. Culminating Task that incorporates Language, Art and Science.

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EDU1301 Science Teachable

**Science and Technology – Grade 8 Understanding Life Systems (Cells)**

**Unit Overview**

Cells are the smallest unit of life, and each cell is a system nested within a system. In Grade 8, students will continue to develop their knowledge of organisms by focusing on the structure and function of cells in plants and animals. Our knowledge of cells has increased enormously since the middle of the twentieth century, and students will examine the implications of this knowledge for individuals, society, and the environment.

Students will also be introduced to the use of microscopes. These are invaluable tools for scientists and provide students with opportunities to explore objects in amazing detail. Microscopes are precision instruments and must be handled with great care. It is important that students be able to identify and explain the importance of practices for handling and using microscopes that not only respect the fragility of the tool but also ensure their personal safety and the safety of others.

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| **Lesson Plans** | **Lesson Information** |
| **Lesson #1: Human Systems Review** | In this lesson students will review the human systems that they were introduced to in Grade 7. After going over the main ones with students, write on index cards the names of different systems, such as the nervous system, respiratory system, or digestive system. Then the class will be spilt into groups of 4 and each group will be assigned a body system. Students will write down everything they know about their system (activating prior knowledge) and read a short description of their system from the handout they receive and make a 5-7 minute presentation to their classmates. |
| **Lesson #2: Human Systems + Cells** | This lesson will be a continuation of lesson one but more teacher led. Students will be shown a smart board presentation of the human body, then one system, then its organ, then its tissue until it reaches the cell. Teachers will describe the organization of cells into tissues, organs, and systems and students will be taking notes in the Science journals. For homework students will pick another system that wasn't used in the presentation and create a similar story until they reach the cell. |
| **Lesson #3: Intro to Microscopes** | In this lesson students will be introduced to the Microscope. Teacher will go over the different parts of a microscope and students will label a Microscope worksheet. Students will then have to define each of the terms using a dictionary. They will then get a handout on different magnifications and using mathematical equations calculate the magnification of each image. |
| **Lesson #4: Microscope Lab** | Microscope Lab – In this lesson students will prepare dry- and wet-mount slides of a variety of objects for use with a microscope. Teacher is to go over all safety precautions with students and students will fill out a worksheet. No Lab report. |
| **Lesson #5: Uni/Multi Cells** | In this lesson students will come in and hand in their Microscope Lab worksheet. Lesson will continue with an introduction to Unicellular and Multi-celluar organisms. Students will need to be able to identify unicellular organisms (e.g., amoebae) and multicellular organisms (e.g., invertebrates [worms], vertebrates [frogs]), and compare ways in which they meet their basic needs (e.g., nutrition, movement, gas exchange.  Students will create pictures in their science journals – there title will be  All Living Things are Made of One or More Cells  1. Create a picture of a plant (a flower, tree, etc) using small units to represent cells. Label the plant “Multicellular: has many cells”  2. Create a picture of a single celled organism and label it “unicellular: only one cell”  3. Create a picture of a human/animal using small units to represent cells. Label the animal “Multicellular: has many cells” |
| **Lesson #6: Diffusion & Osmosis** | This lesson will explain the processes of diffusion and osmosis to the students and their roles within a cell. Students will investigate the properties of diffusion and osmosis by completing a worksheet and answering questions from their textbook. |
| **Lesson #7: Formative Quiz** | Students will write a short quiz based on what they have learned so far before going onto the next section of the unit. Once students are done they will have the rest of the class to write a journal entry of how microscopes have enhanced our understanding of the cells and their functions. |
| **Lesson #9: Intro to Cell theory and Cell Structures** | In this lesson students will be introduced to the cell theory and will need to understand the postulates of the cell theory. Teacher will lead students into identifying structures and organelles in cells, including the nucleus, cell membrane, cell wall, chloroplasts, vacuole, mitochondria, and cytoplasm, and explain the basic functions of each. Students will have a organelle handout that has a visual representation of the organelle and students can write the function or each organelle. |
| **Lesson #10: Cell Lab** | Cell Lab – Students will be using a microscope correctly and safely to find and observe components of plant and animal cells (e.g., using an onion slice or a prepared slide of a protist). Students will make accurate drawings of their observations on their experiment handout sheet. They will be expected to do a complete Lab Report and hand it in next class. Go over safety precautions and usage of a microscope with students. |
| **Lesson #12: Compare and Contrast** | Students will hand in their Cell Lab Reports. Students will use a Venn Diagram to compare the structure and function of plant and animal cells. They will need to identify the structures that only animal cells have and only plant cells have and write down why these structures are important to the function of the animal or plant cell. |
| **Lesson #13: Cell Quiz + Building Blocks of Life Model** | There will be a 15 minute quiz on cells (multiple choice, matching, true and false and two short answers). Students will then be asked to work on a Cell Task.  The Building Blocks of Life  1. Create, using plastercine, an animal cell and a plant cell.  2. Use the computer to type labels for the following parts of a cell: nucleus, cell membrane, cell wall, chloroplasts, vacuoles, mitochondria and cytoplasm.  3. Use the computer to type an explanation for the basic functions of each part of the cell.  4. Attach the label to the appropriate parts of the cell.  5. Attach the explanation for the part functions to the appropriate label.  6. Highlight the cell parts that only plants have in green. |
| **Lesson #14: Building Blocks of Life Model** | Students will continue to work on their Building Blocks of Life Models which are due next class. |
| **Lesson #15: SST Integration** | In this lesson students will assess how our understanding of cells and cell processes has beneficial and harmful effects on human health and the environment, taking different perspectives into account. Each group will be assigned a different role eg farmer, doctor, business man, etc. There will be a short presentation in which they present their ideas to the class. |
| **Lesson #16: Summative Test** | Students will write a test for the full period on the unit – the test will consists of Multiple Choice, Matching, True and False, Short answers + Long Answer questions. |
| **Lesson #17-20: Culminating Task** | Culminating Task – Students will be introduced to their final assignment for the unit. Students will be creating a cell fairground for Canada’s Wonderland. The task will go over a period of 4 to 5 classes and students will be made aware of that. Most of the assignment will be done in class but students can do research and bring in information from home. The task will commence with a short presentation and the winner with the most creative rides will get the opportunity to present their ideas to all the intermediate students as a celebration of their success. |

**Description of Culminating Activity**

For the Culminating task students will show their knowledge of animal and plant cells by creating a cell amusement park brochure/map. Students will need to create fairground rides for Canada’s Wonderland that resemble and function similar to the organelles of the cell. They will then need to persuade their audience into coming to their amusement park through an oral presentation that can be done in any format the student prefers. Students can work in partners for this activity or work individually. The Fairground that gets the most votes will get to present their oral presentation to all the intermediate students as a celebration of their success.